CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 97 - 079
SITE CLEANUP REQUIREMENTS AND RESCISSION OF ORDER No. 93 - 076 FOR

ARCO PRODUCTS COMPANY
RICHMOND BULK TERMINAL
1306 CANAL BOULEVARD
CITY OF RICHMOND
CONTRA COSTA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, hereinafter called the Board finds that:

1. Named Discharger. Arco Products Company, hereinafter called the Discharger, owns and operates a petroleum fuel storage and distribution facility (hereinafter called the Facility).

2. Facility Location. The facility is located in the City of Richmond, Contra Costa County and generally lies between City of Richmond port facility and the Richmond Harbor Channel. The facility is less than half a mile from highway 580.

3. Facility Operation Prior to development the facility was a tidal wetland. The Facility currently receives and distributes gasoline, diesel fuel, lubricating oil, gasoline additives, and jet fuel which are stored in on-site above ground petroleum storage tanks.

4. Purpose of Order. The Order is based upon preliminary findings obtained from investigations at the site or spill reports which indicate that further remedial action may be needed. This Order identifies specific areas of concern and establishes time schedules for workplans to identify remedial actions and implement it. In addition, the establishment of water quality objectives are specified.

5. Facility Description. The facility is composed of two operational sites as identified below and shown on Figure 1:

   a. The "Lower Terminal Site" is a 28-acre unit bounded by the UNOCAL Richmond Oil Terminal to the North, Canal Boulevard to the west and Santa Fe Channel to the east. The truck loading rack, ship on/off loading dock, train car off loading rack, two tank farms, underground tanks, and office building areas are all located in the lower tank farm area.

   b. The "Upper Terminal Site" is a 17 acre unit bounded to the east, west and south by the City of Richmond port facility and is bounded to the north by East Bay Regional Park property. Primary contents of this area are aboveground petroleum storage tanks.

6. Release Locations. Releases of contaminants were identified in the Lower Terminal Site as a result of site investigations, staff observations and construction activities. The areas of releases identified in the lower terminal include the tank farm, truck loading rack, harbor channel dock

and office area. In the Upper terminal, indications of hydrocarbon impact are seen primarily in the groundwater monitoring wells adjacent to Canal Boulevard. The impact in these Upper Terminal wells will be addressed in conjunction with remedial action at the Lower Terminal.

7. Contaminant Impact at Unocal's Richmond Petroleum Storage Terminal . Unocal's Richmond Terminal is directly north of the Lower Tank Farm Area. The "Quarterly Groundwater Sampling Report" submitted by Unocal identifies the presence free phase hydrocarbon and groundwater contamination in the southern part of the Unocal Terminal. The contaminated area is directly across from the Discharger's Facility. A city storm sewer runs between the two facilities in a west to east direction toward Harbor Bay. Reports from both facilities indicate that shallow groundwater within the property boundary area flows in the direction of the storm sewer. The sewer line is suspected to be a conduit for contaminant transport toward the Bay.

LOWER TERMINAL SITE

8. General Geology. The Lower Terminal Site has a mantle of fill made up of silt, sand and gravel. The fill is underlain by alluvial deposits to depths of up to 35 feet below ground surface and consists of interbedded layers of clay, silty and sandy clay, sandy silt, clayey sand and gravel. The alluvial deposits is most probably underlain by bay mud. Limited information indicates that possibly two interconnected aquifers exist within 35 feet depth interval explored. Shallow groundwater occurs at about 3 feet to 5 feet below ground surface and generally moves toward the Harbor Channel. Hydraulic conductivity in the more permeable deposits range from 4.12×10^{-3} cm/sec. to 1.47×10^{-2} cm/sec, while less permeable clayey deposits indicate a conductivity of 2.35×10^{-5} cm/sec.

9. Identified Impacts investigation & Remedial Actions : Soil and groundwater samples from monitoring wells installed in the vicinity of Lower Terminal have been analyzed for contaminants and results, documented in three technical reports 1, 2, 3 (see attached references), indicate the presence of hydrocarbon constituents. Impacted areas include the tank farm, an area along Harbor Channel, office block, truck loading dock, and rail loading dock. The extent of impact in the terminal requires the implementation of targeted hot spot remedial action and /or downgradient migration control or a feasible combination of the above strategies.

UPPER TERMINAL SITE

10. General Geology - The Upper Terminal is situated on a hill top with steep slopes. It is generally covered by about 5 feet of unconsolidated sediments at the top and up to 22 feet of unconsolidated sediments at the lower level slopes. The sediments are generally underlain by fractured bedrock. Groundwater depths range from 106 feet bgs in the higher level areas to 6 feet bgs at the lower level areas. Hydraulic conductivity in the permeable sediments of the lower level areas is about $(0.965 \text{ to } 2.2) \times 10^{-2}$ cm/sec.

11. Identified Impact / Remedial Actions. - Indications of hydrocarbon impact are seen primarily in the lower elevation wells adjacent to Canal Boulevard. The impact in these wells will be addressed in conjunction with remedial action at the Lower terminal.

GENERAL FINDINGS

12. Regulatory Status. The Regional Board and State Water Board has adopted the following Orders for this site:

    a. A stormwater NPDES Discharge Permit Number 2 07S002986 issued by the State of California State Water Resources Control Board. The Facility's industrial waste is discharged to the City of Richmond POTW. The discharger does not operate any groundwater treatment system at this time.

    b. Site Cleanup Requirement (Order No. 93 - 076) adopted July 21, 1993.

13. Basin Plan. The Regional Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21, 1995. This updated and consolidated plan represents the Board's master water quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board and the Office of Administrative Law on July 20 and November 13, respectively, of 1995. A summary of regulatory provisions is contained in Title 23 of the California Code of Regulations at Section 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the State, including surface waters and groundwaters.

14. State Water Board Policies.

    a. State Water Board Resolution No. 68 - 16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," applies to this discharge and requires attainment of background levels of water quality, or the highest level of water quality which is reasonable if background levels of water quality can not be restored. Non - background cleanup levels must be consistent with the maximum benefit to the people of the state, not unreasonably affect present and anticipated beneficial uses of such water and not result in exceedence of applicable water quality objectives.

    b. State Water Board Resolution No. 92 - 49, "Policies and Procedures for Investigation and cleanup and Abatement of Discharges under Water Code Section 13304," applies to this discharge. This order and its requirements are consistent with the provisions of Resolution No. 92 - 49, as amended.

15. Other Board Policies.

    a. Reuse or Disposal of Extracted Groundwater: Board Resolution No. 88 -160 allows discharges of extracted, treated groundwater from site cleanups to surface waters only if it has been demonstrated that neither reclamation nor discharge to the sanitary sewer is technically and economically feasible.

    b. Sources of Drinking Water: Board Resolution No. 89 - 39, Sources of Drinking Water," defines potential sources of drinking water to include all groundwater in the Region, with

limited exceptions for areas of high TDS, low yield, or naturally high contaminant levels.

16. Beneficial Uses.

a. Surface Waters. The existing and potential beneficial uses of the Richmond Harbor Bay are:

i. Industrial Process and Industrial Service Supply;
ii. Navigation;
iii. Water Contact Recreation;
iv. Non Contact Recreation;
v. Ocean Commercial and Sport Fishing;
vi. Wildlife Habitat;
vii. Preservation of Rare and Endangered Species;
viii. Fish Migration and Spawning;
ix. Shellfish Harvesting, and;
x. Estuarine Habitat.

b. Ground Waters. Groundwater at the site is not utilized for drinking water purposes. The potential beneficial uses of groundwater in the vicinity of the facility are:

i. Industrial, agricultural, municipal and domestic water supply for deep (> 25 feet bgs) aquifers;
ii. Agricultural and Industrial for shallow (< 25 feet bgs) aquifers.

17. Chemicals of Concern. Soil and ground water contaminants of concern consist of petroleum hydrocarbons as gasoline, diesel, jet fuel, kerosene, recoverable hydrocarbon, benzene, toluene, ethylbenzene, xylene, other volatile and semi volatile organic compounds, uncharacterized hydrocarbon in the carbon chain range of C4 - C24 and additives.

18. Cost Recovery. Pursuant to the California Water Code Section 13304, the discharger is hereby notified that the Board is entitled to, and may seek reimbursement for, all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this order.

19. California Environmental Quality Act. This action is an Order to enforce the laws and regulations administered by the Board. As such, this action is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to Section 15321, of the Resources Agency Guidelines, Title 14 of the California Code of Regulations.

20. Notification. The Board has notified the discharger and all interested agencies and persons of its intent under the California Water Code Section 13304 to prescribe the site cleanup requirements for the discharge and has provided them with the opportunity to submit their written comments.

21. Public Hearing. The Board, at a public meeting, heard and considered all comments pertaining

to the discharge.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the discharger (or its agents, successors or assigns), shall cleanup and abate the effects described in the above findings as follows:

PROHIBITIONS

1. The discharge of wastes in a manner which will degrade water quality or adversely affect the beneficial uses of the waters of the State of California is prohibited.

2. Further significant migration of pollutants, waste or hazardous waste through subsurface transport to waters of the State of California is prohibited. Significant migration shall be deemed to occur if constituent concentrations exceed or equals established water quality goals / standards at points of compliance.

3. Activities, associated with the subsurface investigation and site cleanup, that cause significant adverse migration of pollutants, waste or hazardous waste are prohibited, except as approved by the Executive Officer of the Board.

CLEANUP PLAN & CLEANUP STANDARDS

1. **Implementation of Cleanup Plan:** The discharger shall comply with the tasks, schedules, and provisions of this Order, in accordance with the time schedule and tasks set here in.

2. **Water Quality Goals / Standards:** The discharger shall conduct remedial activities at the site so as to maintain water quality standard / goals at the compliance points. The discharger shall propose water quality standards / goals acceptable to the Executive Officer, according to the requirements of this Order, for the following parameters and substance groups:

   Total petroleum hydrocarbons as gasoline;
   Total petroleum hydrocarbons as diesel;
   Total Recoverable Petroleum Hydrocarbon;
   Benzene, toluene, ethylbenzene and xylene and;
   Some other volatile and semi - volatile organic compound if required.

TASKS & SCHEDULES

1. **Lower Terminal Site.** Several areas requiring further investigation and /or remedial activities have been identified. The discharger shall document all phases of work and shall submit technical and construction reports as follows:

   a. The discharger shall prepare a workplan for investigations and a report of the investigation. The investigation shall include the installation of two monitoring wells within the potentially impacted deep aquifer at depths within the screen length of well 23LD. The investigation

shall seek to confirm and define contaminant impact in soil and groundwater, gradients and flow direction of this deep aquifer. The investigations shall characterize the unidentified hydrocarbons detected in shallow and deeper aquifers below the Lower Terminal Site. The potential for the sewer lines to provide conduits for migration of contaminants shall be investigated and shall include a review of the as built drawings of the sewer lines. The discharger shall submit these reports as acceptable to the Executive Officer as follows:

Workplan for Investigation Due: No later than July 30, 1997.
Report of Investigation Due: No later than October 30, 1997.

b. Several issues of concern identified at the facility include migration issues in the vicinity of wells 8L to 5L along the harbor channel, in the vicinity of wells 1L to 4L along the Arco - Unocal property boundary , in the vicinity of wells 15L close to a sewer line and the office block, as well as source issues in the vicinity of the tank farm, office block, truck loading duck, and rail loading duck. The discharger shall implement remedial actions to address these issues and areas of concern. For this purpose the discharger shall prepare a remedial evaluation plan. An acceptable plan shall include: (1) an aggresive plan for source remediation or, (2) a plan for migration control along the periphery of the site followed by source remediation or, (3) a combination of the above strategies. Plans which consists predominantly of isolated treatment of groundwater in the immediate vicinity of individual monitoring well without consideration of possible source remediation or areal migration control are not acceptable. The plan shall include a detailed description of various remedial alternatives, cost estimates, estimates of environmental impact of each alternative and identify recommended alternative. The report shall include a detailed discussion of each alternative's applicability, efficiency and expected results. The discharger shall submit the reports as acceptable to the Executive Officer as follows:

The Conceptual Remedial Evaluation Plan is due no later than October 30, 1997.

c. For the recommended alternative in Task 1.b above, approved by the Executive Officer, Arco shall prepare a remedial design report. The report shall include at a minimum, a detailed description of processes, design drawings, specifications and capacities, description of equipment, location and rationale for placement, tables of actual cost estimates for the project, a description of performance evaluation method and implementation schedule. All additional investigations for this design must be approved by staff. All phases of the report must be submitted, as acceptable to the Executive Officer, no later than **February 28, 1998.**

d. Arco shall implement the plan as stated in Task 2.c. and submit a report of certification of construction as acceptable to the Executive Officer. The report shall include the final as built design details and specifications, a description and schedule for post construction maintenance and improvements. In addition, the report shall include the results of first performance evaluation and cost estimates for the maintenance and performance evaluation program.

Report due no later than September 17, 1998

2. **Post Earthquake Inspection and Corrective Action Plan.** The discharger shall submit a detailed Post Earthquake Inspection and Corrective Action Plan for all instruments of remedial activity in place. The plan shall be implemented in the event of any earthquake generating ground shaking of Magnitude V or greater on a Richter scale at or near the instruments of remedial activity. The report shall describe the equipment, trenches, ground water monitoring and extraction systems potentially impacted by the seismic response of the remedial system. The plan shall provide for preliminary verbal reporting of the post earthquake inspection to the Board within 18 hours of the occurrence of the earthquake. A follow up written report will be submitted if requested by the Executive Officer. Immediately after an earthquake event causing damage to the remedial system structures, the corrective action plan shall be implemented and this Board shall be notified of any damage.

   Report Due: No later than the due date for submittal of certification of construction report for Task 1.d.

3. **Ground Water Quality Goal / Protection Standards.** The discharger shall submit a proposal for water quality standards and goals for all remedial action location and down gradient boundary sections as acceptable to the Executive Officer. Applicable constituents may include but not limited to the constituent listed in this order. The proposal shall include a decision making procedure for shutting down or resumption of remedial activity if trigger levels are exceeded. The proposal for the water quality standards and goals shall be due **no later than December 16, 1998** as follows:

   a. Water quality goals shall apply within the facility in areas where remedial activity is taking place or shall be implemented in sections where impact is being monitored for possible remedial action. Water quality goals shall be set for but not limited to tank farm areas, truck loading duck and rail road loading.

   b. Water quality protection standards shall be established for the groundwater downgradient boundary areas to protect the existing water quality of surface and groundwater beyond Arco's operating boundaries. Water quality protection standards shall be set for but not limited to areas along the harbor channel, Unocal - Arco property line and sewer line area behind the office block (in the vicinity of well 15L).

PROVISIONS

1. **No Nuisance:** The storage, handling, treatment, or disposal of polluted soil or groundwater shall not create a nuisance as defined in California Water Code Section 13050 (m).
2. **Good Operation and Maintenance (O&M):** The discharger shall maintain in good working order and operate as efficiently as possible any facility or control system installed to achieve compliance with the requirements of this Order.

3. **Cost Recovery**: The discharger shall be liable pursuant to California Water Code Section 13304, to the Board for all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effect

thereof, or other remedial action, required by this Order. If the site addressed by this Order is enrolled in a State Board - managed reimbursement program, reimbursement shall be made pursuant to this Order and according to the procedures established in that program. Any disputes raised by the discharger over reimbursement amounts or methods used in that program shall be consistent with the dispute resolution procedures for that program.

4. The Discharger shall continue to implement the approved plan for the installation of tank bottom monitoring systems pursuant to Section 25270.7 (c) of the California Health and Safety Code (Aboveground Petroleum Storage Act). The discharger shall submit annual report of work in progress and compliance as acceptable to the Executive Officer.

5. **Access to Site and Records:** The discharger shall permit the Board or its authorized representative, in accordance with Section 13267(c) of the California Water Code, the following:

   a. Entry upon premises in which any pollution sources exist, or may potentially exist, or in which any required records are kept, which are relevant to this Order;

   b. Access to copy all records required to be kept under the terms and conditions of this Order;

   c. Inspection of any monitoring equipment or methodology implemented in response to this Order; and,

   d. Sampling of any ground water or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.

6. **Self Monitoring Program**: The discharger shall comply with the self monitoring program as attached to this Order and as may be amended by the Executive Officer.

7. **Technical Reports:** Technical reports, submitted by the discharger, in compliance with the Prohibitions, Specifications, tasks and Provisions of this Order shall be submitted to the Board on the schedule specified herein. These reports shall consist of a letter report that includes the following:

   a. A summary of work completed since submittal of the previous report and work projected to be completed by the time of the next report;

   b. Identification of any obstacles which may threaten compliance with the schedule of this Order and what actions are being taken to overcome these obstacles;

   c. In the event of non-compliance with any Prohibition, Cleanup plan, Provision or Tasks of this Order, written notification which clarifies the reasons for non-compliance and which proposes specific measures and a schedule to achieve compliance. This written notification shall identify work not completed that was projected for completion, and shall identify the impact of non-compliance on achieving compliance with the remaining requirements of this Order and,

8. **Contractor Qualification** All submittal of hydrogeological documents (plans, specifications and reports, and reports shall be signed by and stamped with the seal of a California certified engineering geologist, or registered professional civil engineer.

9. **Laboratory Qualifications:** All samples shall be analyzed by State certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control records for Board review. This provision does not apply to analyses that can only reasonably be performed on site (e.g temperature).

10. **Document Distribution:** Copies of all correspondence, reports and other documents pertaining to compliance with this Order, submitted by the discharger, shall also be provided to the following agencies:

    a. City of Richmond, Planning Department;
    b. Contra Costa County Health Department, and;
    c. California EPA, DTSC.

11. **Reporting of Changed Ownership or Operator:** The discharger shall file a report of change of ownership or occupancy associated with the property described in this Order following any changes in ownership or occupancy.

12. **Reporting of Hazardous Substance Release:** If hazardous substances or designated waste is discharged in or on any waters of the state, or discharged and deposited in any place where it may be carried off to, or probably will be discharged in or on any waters of the state, the discharger shall report such discharge / incidents to the following:

    a. This Regional Board at (510) 286-1255 on weekdays during office hours from 8 a.m. to 5 p.m.; and,
    b. The Office of Emergency Services at (800) 852- 7500.

    Hazardous and designated substances include wastes and chemicals as defined in Title 22 and Title 23 of the California code of Regulation and the California Water Quality control Act. A written report shall be filed with the Regional Board within five working days and shall contain information relative to the nature of waste or pollutant, the quantity involved and the duration of incident, the cause of spill, the estimated size of affected area, the corrective measures implemented or planned, and a schedule of these measures and, the persons/agencies notified.

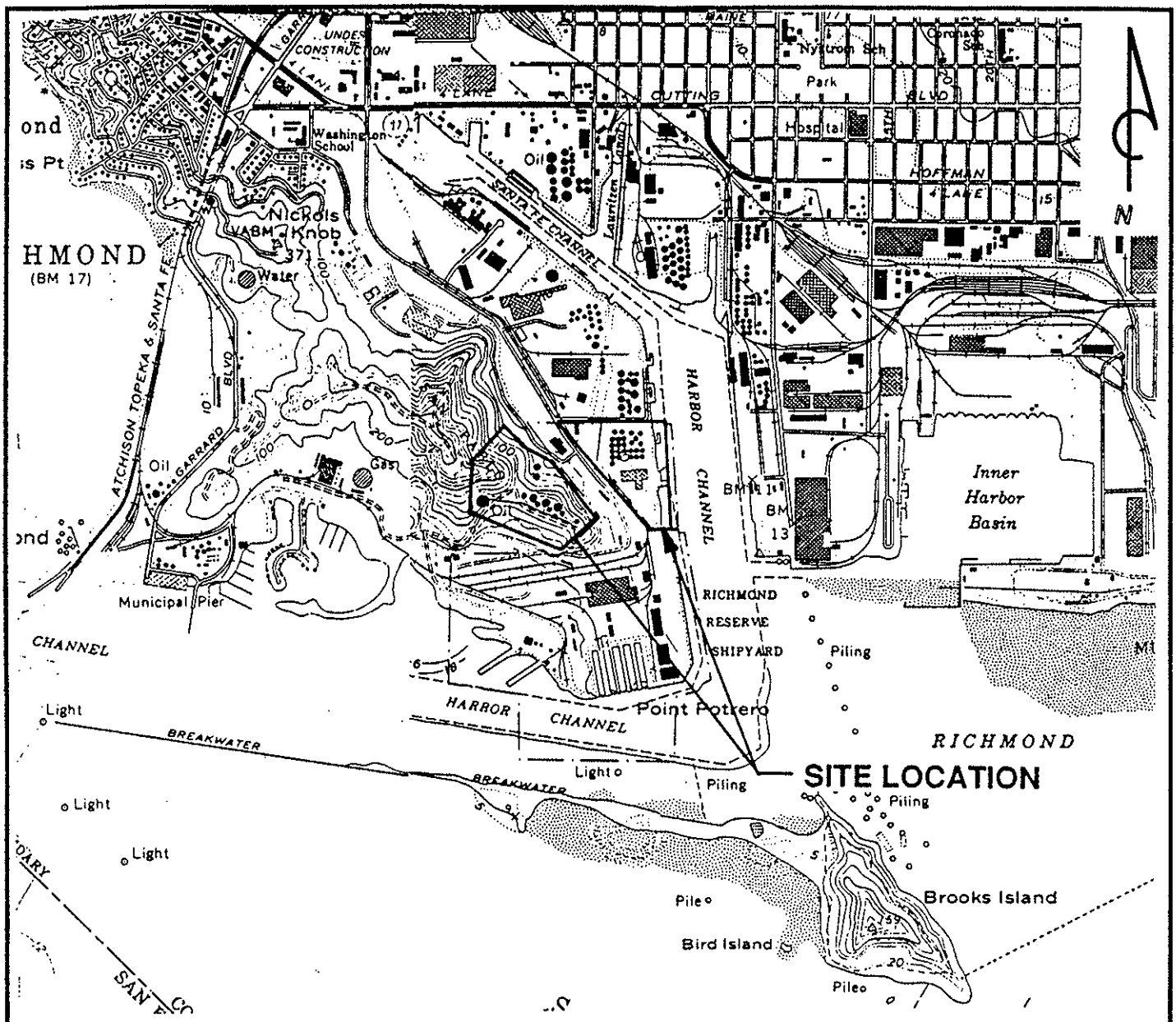
13. **Rescission of Existing Order:** This Order rescinds Order No. 93 - 076

14. **Periodic SCR Review**: This Order is subject to Board review and updating, as necessary, to comply with changing state or Federal Laws, regulations, policies, or guidelines; changes in the Board's Basin plan; or changes in the discharge characteristics. The discharger may request for a revision of this order and upon review, the Executive Officer may recommend that the Board revise these requirements.

I, Loretta K. Barsamian, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region on June 18, 1997.

for Loretta K. Barsamian
Executive Officer

Attachments:
Figure 1: Site Location Map
Figure 2: Site Plan Map
Table 1: References
Groundwater Self Monitoring Program.



QUADRANGLE LOCATION

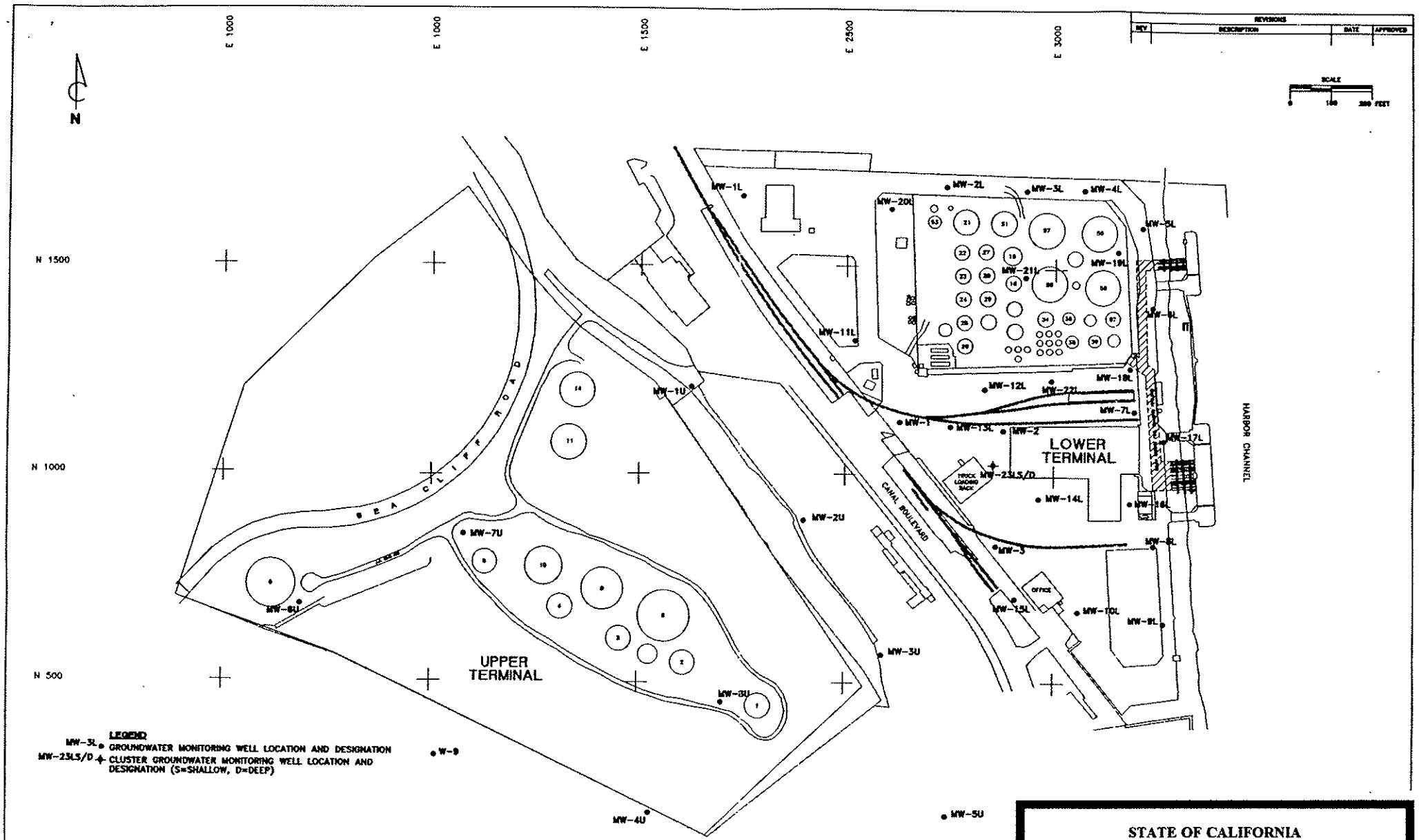
REFERENCES:

USGS 7.5 MIN. TOPOGRAPHIC MAP
TITLED: RICHMOND, CALIFORNIA
DATED: 1959 REVISED: 1980
TITLED: SAN QUENTIN, CALIFORNIA
DATED: 1959 REVISED: 1980

SCALE IN FEET

2000 0 2000

STATE OF CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN FRANCISCO BAY REGION	ARCO RICHMOND BULK TERMINAL 1306 Canal Boulevard Richmond, California	
FIGURE 1: SITE LOCATION MAP **Arco Richmond Bulk Terminal**	SITE LOCATION MAP	



STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

FIGURE 2: SITE MAP
Arco Richmond Bulk Terminal

Table 1: SOME REFERENCES USED IN WRITING THIS ORDER

1. PHASE II ENVIRONMENTAL ASSESSMENT REPORT,(EMCON) JULY, 1994
2. REPORT OF SUBSURFACE ASSESSMENT (HARTCROWSER), MARCH 91
3. SOIL AND GROUNDWATER INVESTIGATION REPORT (P.E.G.), JANUARY 3, 1997.
4. REPORT OF TANK REMOVAL (HARTCROWSER), MARCH 90
5. PHASE 2 SOIL AND GROUNDWATER ASSESSMENT (GERAGHTY & MILLER), SEPTEMBER, 1992

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

ARCO PRODUCTS COMPANY (Richmond Bulk Terminal)

1306 Canal Boulevard.,

RICHMOND, CONTRA COSTA, COUNTY

SITE CLEANUP REQUIREMENTS
ORDER NO. 97 - 079

1. Monitoring Program pursuant to Water Code Sections 13267 and 13304. This Self - Monitoring Program pursuant to Water Code Sections 13267 and 13304 is intended to document compliance with Board Order No. 97 - 079.(Site Clean Requirements).

2. **Monitoring:** The discharger shall measure groundwater elevations on a semi-annual bases in all monitoring wells or sumps to the nearest 0.1 inch, and shall collect and analyze representative samples of groundwater according the following table 1. The discharger shall sample any new monitoring or extraction wells quarterly and analyze groundwater samples for the same constituents as shown in the above table. The discharger may propose changes in the above table; any proposed changes are subject to Executive Officer approval.

3. **Quarterly Monitoring Reports:** The discharger shall submit quarterly monitoring reports to the Board no later than 30 days following the end of the quarter. The first quarter self monitoring report shall be due on April 30th of each year. The report shall include but not limited to:

   a. Transmittal Letter: The transmittal letter shall discuss any violations during the reporting period and actions taken or planned to correct the problem. The letter shall be signed by the Discharger's principal Executive Officer or his/her dully authorized representative, and shall include a statement by the official, under penalty of perjury, that the report is true and correct to the best of the official's knowledge.

   b. Groundwater Elevations: Groundwater elevation data shall be presented in tabular form, and a groundwater elevation map should be prepared for each monitored water bearing zone. Historical groundwater elevation shall be included in the fourth quarter report each year.

   c. Groundwater sampling data shall be presented in tabular form, and an ISO-concentration map should be prepared for one or more key contaminants for each monitored water bearing zone, as appropriate. The report shall indicate the analytical method used, detection limits obtained for each reported constituent, and a summary QA / QC data. Historical groundwater sampling results shall be included in the fourth quarterly report each year. The report shall describe any significant increases in contaminant concentrations since data, such as lab data sheets, need not be included (however, see record keeping - below).

   d. Groundwater Extraction: If applicable, the report shall include groundwater extraction results in tabular form, for each extraction well, trench or sump and for the site as a whole, expressed in gallon per minute and total groundwater volume for the quarter. The report shall include estimates of free phase and contaminants removed from groundwater extraction wells, trenches, sump and other remedial systems (e.g. soil vapor extraction), expressed in units of chemical mass per day and mass for the quarter. Historical mass removal results shall be in the fourth quarterly report each year.

   e. Status Report: The quarterly report shall describe relevant work completed during the reporting period (e.g. site investigation, interim remedial measures) and work planned for the

following quarter.

4. **Observations and Test Procedures:** In addition to the chemical constituent indicated in table 1 above, the discharger shall sample for the following parameters:

   a. Ground water temperature measured at the time of sampling and reported in degrees Fahrenheit;

   b. Ground water electrical conductivity measured at the time of sampling as per Standard Methods 205 using potentiometric methodology;

   c. Ground water pH measured at the time of sampling as per Standard Methods 423 or EPA 150.1;

   d. Ground water turbidity measured at the time of sampling Using EPA 180.1 or other approved field methods and;

   e. Alkalinity, Ammonia and chloride content using EPA 310, EPA 350 and EPA 325 methods

5. **Violation Reports:** In the event the discharger violates or threatens to violate the conditions of the Site Cleanup Requirement. The discharger shall notify the Regional Board office by telephone as soon as he or his agents have knowledge of the incident and confirm this notification in writing within 7 working days of the telephone notification. The written report shall include time and date, duration and estimated volume of release, method used in estimating volume and person notified of the incident. The report shall include pertinent information explaining reasons for the noncompliance and shall indicate what steps were taken to prevent the problem from recurring.

6. **Other Reports:** The discharger shall notify the Board in writing prior to any site activities, such as construction or tank removal, which have the potential to cause further migration of contaminants or which would provide new opportunities for site investigation.

7. **Record Keeping:** The discharger or his/her agent shall retain data generated for the above reports, including lab results and QA/ QC data, for a minimum of six years after origination and shall make them available to the Board upon request.

8. **SMP Revisions:** Revisions to the Self Monitoring Program may be ordered by the Executive Officer, either on his / her own initiative or at the request of the discharger. Prior to making SMP revisions, the Executive Officer will consider the burden including costs, of associated self-monitoring reports relative to the benefits to be obtained from these reports.

I, Loretta K. Barsamian, Executive Officer, hereby certify that the foregoing Self-Monitoring Program is as follows:

1. Developed in accordance with the procedures set forth in this Board's Resolution No. 73-16;

2. Adopted by the Board and Effective on the date shown below; and;

3. May be reviewed or modified at any time subsequent to the effective date, upon written notice from the Executive Officer, or request from the discharger.

June 18, 1997
Date Ordered

for Loretta K. Barsamian
Executive Officer

Attachment: Table 2: Groundwater Monitoring Frequency and Parameters

Table 2: GROUNDWATER MONITORING FREQUENCY AND PARAMETERS FOR ARCO'S RICHMOND BULK TERMINAL

MONITORING WELL (mw)	SCREEN DEPTH (BGS) FEET	ZONE	SAMPLING FREQ.	TERMINAL	SPH, INCHES	TPH,Gas. 5030/8015m	TPH,Diesel 3510/8015m	BENZENE 5030/8020	TOLUENE 5030/8020	ETHYL. BENZENE 5030/8020	XYLENE 5030/8020	MTBE 8020 &/or 8260	TEPH, 418.1	
MW-1	5 - 20	S/ME	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW-2	5 - 20	S/ME	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW-3	5 - 20	S/ME	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 1L	4.5 - 13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 2L	4.5 - 13.5	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 3L	5 - 14	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 4L	4.5 - 13.5	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 5L	4.5 - 13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 6L	4.5 - 13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 7L	4.5 - 13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 8L	4.5 - 13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 9L	4.5 - 13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 10L	4.5 - 13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 11L	4.5 - 13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 12L	4.5 - 10	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 13L	4.5 - 13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 14L	4.5 - 13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 15L	3 -13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 16L	3 -13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 17L	3 -13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 18L	3 -13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 19L	3 -13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 20L	3 -13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 21L	3 -13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 22L	3 -13	S	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 23L/S	18 - 22.5	ME	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 23L/D	30 - 35.5	D	Semi - annual	L	X	X	X	X	X	X	X	X	X	
MW- 1U	4.5 - 13	S	Semi - annual	U	X	X	X	X	X	X	X	X	X	
MW- 2U	4.5 - 13	S	Semi - annual	U	X	X	X	X	X	X	X	X	X	
MW- 3U	5 - 12	S	Semi - annual	U	X	X	X	X	X	X	X	X	X	
MW- 4U	10 - 20	ME	Semi - annual	U	X	X	X	X	X	X	X	X	X	
MW- 5U	6.5 - 20	S/ME	Semi - annual	U	X	X	X	X	X	X	X	X	X	
MW- 6U	55 - 80	N/A	Annual	U	X	X	X	X	X	X	X	X	X	
MW- 7U	55 - 80	N/A	Annual	U	X	X	X	X	X	X	X	X	X	
MW- 8U	110 - 135	N/A	Annual	U	X	X	X	X	X	X	X	X	X	
W- 9		UNK	Annual	U	X	X	X	X	X	X	X	X	X	

KEY TO TABLE 2 ACRONYMS

MW - 1L	Monitoring Well 1 in the Lower Terminal Area	L	Lower Terminal
MW - 1U	Monitoring Well 1 in the Upper Terminal Area	U	Upper Terminal
S	Indicates wells screened in the shallow depth zone	5030/8015m	EPA Analytical Method 5030/8015m
ME	Indicates wells screened in the medium depth zone		
D	Indicates wells screened in the deeper depth zone		